

## SEQUENCE LISTING

<110> Bird, Timothy A.  
 Peschon, Jacques J.  
 Sims, John E.  
 Virca, G. Duke  
 Willis, Cynthia R.

<120> Methods for Regulating Vascularization Using GEF  
 Containing NEK-Like Kinase (GNK)

<130> Immunex GNK/sGNK PCT

<140> Not Yet Assigned

<141> 1999-12-17

<150> 60/113,003

<151> 1998-12-18

<160> 19

<170> PatentIn Ver. 2.0

<210> 1

<211> 4610

<212> DNA

<213> Homo sapiens

<400> 1

```

gcggcagcgg cgccggctga ggagggcccg gcctgcgaga gcctcagtgg gagccggctc 60
agccctcggc caccatgtcg gcgccgtcgg aggaggagga gtacgcgcgg ctgggtgatgg 120
aggcgcagcc ggagtggctg cgcgccgagg tgaagcggct gtcccacgag ctggccgaga 180
ccacgcgtga gaagatccag gcggccgagt acgggctggc ggtgctcgag gagaagcacc 240
agctcaagct gcagttcgag gagctcgagg tggactatga ggctatccgc agcgagatgg 300
agcagctcaa ggaggccttt ggacaagcac acacaaacca caagaagggtg gctgctgacg 360
gagagagccg ggaggagagc ctgatccagg agtcggcctc caaggagcag tactacgtgc 420
ggaaggtgct agagctgcag acggagctga agcagttgcg caatgtcctc accaacacgc 480
agtcggagaa tgagcgcctg gcctctgtgg cccaggagct gaaggagatc aaccagaatg 540
tgagatcca gcgtggccgc ctgcgggatg acatcaagga gtacaaattc cgggaagctc 600
gtctgctgca ggactactcg gaactggagg aggagaacat cagcctgcag aagcaagtgt 660
ctgtgctcag acagaaccag gtggagtttg agggcctcaa gcatgagatc aagcgtctgg 720
aggaggagac cagtagcctc aacagccagc tggaggatgc catccgcctc aaggagatct 780
cagagcggca gctggaggag gcgctggaga ccctgaagac ggagcgcgaa cagaagaaca 840
gcctgcgcaa ggagctgtca cactacatga gcatcaatga ctcttctac accagccacc 900
tgcatgtctc gctggatggc ctcaagttca gtgacgatgc tgccgagccc aacaacgatg 960
ccgaggccct ggtcaatggc tttgagcagc gcggcctggc caagctgcca ctggacaaca 1020
agacctccac gcccaagaag gagggcctcg caccgcctc cccagcctc gtctccgacc 1080
tactcagtga gctcaacatc tctgagatcc agaagctgaa gcagcagctg atgcagatgg 1140
agcgggaaaa ggccggcctg ctggcaacgc tgcaggacac acagaagcag ctggagcaca 1200
cgccggggctc cctgtcagaa cagcaggaga aggtgacctg cctcacagag aatctgagtg 1260
ccctgcggcg cctgcaggcc agcaaggagc ggcagacagc cctggacaac gagaaggacc 1320
gtgacagcca tgaggatggg gactactacg aggtggacat caacgggcct gagatcttgg 1380
cctgcaagta ccatgtggct gtggctgagg ctggcgagct ccgagagcag ctcaaggcac 1440
tgcgagcac gcacgaggct cgtgaggccc agcacgcga ggagaagggc cgctatgagg 1500
ctgaggccca ggcactcacg gagaagggtc ccctgctaga gaaggccagc cgccaggacc 1560
gcgagctgct ggcccggtg gagaaggagc taaagaagggt gagcgacgtc gccggcgaga 1620
cacagggcag cctgagtgtg gcccaggatg agctgggtgac cttcagttag gagctggcca 1680
atctctacca ccacgtgtgc atgtgcaaca atgagacacc caaccgtgtc atgctggact 1740
actaccgcga gggccagggc ggggcccggc gcaccagtc cggggggcgc accagccccc 1800
aggcgcgtgg ccggcgctca cccatcctcc taccgaagg gctgctggct cctgaggcgg 1860
gccgagcaga tgggtgggac ggggacagca gccctcgcg tggctcctca ctgccatcac 1920

```

ccctgagtga cccacgccgg gagcccatga acatctacaa cctgatcgct atcatccgtg 1980  
 accagatcaa gcacctgcag gcagccgtgg accgcaccac ggagctgtca cgccagcgca 2040  
 ttgcctctca ggagctgggg cccgccgtgg acaaggacaa ggaagcgctt atggaggaga 2100  
 tcctcaagct gaagtcgctg ctcagcacca agcgggagca gatcaccacg ctgcgactg 2160  
 tgctcaaggc caacaagcag acggccgagg tggcccttgc caacctgaag agcaagtatg 2220  
 agaattgaaa ggccatgggtt accgagacca tgatgaagct gcgcaatgag ctcaaggccc 2280  
 tcaaggagga cgcagccacc ttctctcgc tgcgtgctat gtttgccacc aggtgtgacg 2340  
 agtacattac acagctggat gagatgcagc ggcagctggc ggctgctgag gacgagaaga 2400  
 agacgctgaa ctgcgtgctg cgcattggcca tcagcagaa gctggcgctg acccagcggc 2460  
 tggagctgct cgagctggac catgagcaga cccggcgctg ccgtgccaaa gccgccccga 2520  
 agaccaagcc agccacaccg agcctgtaga gtagctgcca ggaggacttg gccacccggc 2580  
 cctgtcacac tgcagccctt tccccctccc tctcgtggcc cacaaggagg aaggaagggc 2640  
 aacctaaaaa cccacttaga aactttttgg atatgccact gcaattcttt tcaaaatagc 2700  
 attccccagg tttttaaatg gaggaaaaaa agctttaatg ttgagcatgc tgcgagctgc 2760  
 tgcgtggaaa ggccctctgta tgggcccgaag acccttcttc cctggctgcc aggtctgcca 2820  
 ggagcccact ggaaacgccc accacggggg ctccttggtt cacatgttct ttttttatcc 2880  
 gatcaacctg tgcacttttg atattttgat attatatttg cttccttaat tctcgcgta 2940  
 gagacggctc caggtgccgt ggtctatgct cgtggctcctg tagctgtccg cctcagctcc 3000  
 caccgtgttt gtctgggtgtc agcacgagcg agagctgtgt gctccatagc gtgtagcttt 3060  
 agactcggag atgagtgtct tgaccagcg aggagctcag ctaagtgtat ccacgctgtg 3120  
 gttcagcagc ctttagatca tacggcattg tggttcatgt ttgaaattac agatttttaa 3180  
 tgccatgttc attaagaaat ccagggtatt cagattctgg ggtttttcat attgtattat 3240  
 tattattctt aggaatagtt caatgtaaca agaagaaaac ttgacctttg ctctgggttaa 3300  
 aacagtaata ggcacttgaa aaaaaaagat aaattattga atgagtagta ttacctacaa 3360  
 attccagaat tttctgggtt ttaggacgtt gtgaagcatg actgattaac agaattttat 3420  
 acaactgtac caataaaaatt ccaaattgga attgttttgt tactctgggt gttgtgcca 3480  
 attgtggtac acttagaaaa ttctacagtc gtcgattttt aggggtgtct ctttcaacac 3540  
 ctttttggtt gtaatcattg ccagtagtgc cttcatcagt taaggagagt gtcccagcac 3600  
 agatcattct caaaagcgag cagggaagag ctagtgggca tgctgaaggc cagcgtggac 3660  
 agcaggtgag gcaggtgctc ctcacacca gacctgggca tcttcattga gggaaagaaa 3720  
 acagtcattg tgcaaaattc tgtagtcag tgattcttta cttgcaaatt caggggctta 3780  
 gaaaatgaaa gcaaacacaa aaccttgagt gtgctttggg aaccaaatgg accttctggg 3840  
 acaagctgag caagctgtat gaacgccacg tttgtgaaga gctgagggtta tcaggagggc 3900  
 cgacgctgtg ttggcatgcg cagtagggga tgagggttag ccatagtatt ctttgcaaat 3960  
 gtgaaagcga gacattatat cttctcttgc ttggtgtaac taatcactgt taatttcagg 4020  
 aaacagaact cattaaaact ccttagcaaa ccaggtctac atcctgtttt gtttgctgag 4080  
 tgaggttagt gggagtggtc aaattggtac tcttgaggga agaaaaactg tcttctcttc 4140  
 tccaaaaaag gaaaaattat aataatataa atgacaaaaa taaaagaatt ctgtttctctg 4200  
 gaataagcat ttcttattcc tagttgtagg gactcctatt tttaccttc gttacagtgt 4260  
 tgattcataa gaaatattgt tacatttgag ataacttcac ctgtatgggg tattttattg 4320  
 caatgatgtc tgagtactgt attttttctg tgcattacct tagtgtcaga atgttggtct 4380  
 ttatttttaa gtcattatgca tgttctctctg ccaaggaacc ttacacaga cccaaacaaa 4440  
 aaaataataa tcaaatgcct tcaatttctg agaaaatgag gcagagcatg gaaaaggaa 4500  
 aggaaggaga aattaattga gattttcagg acacagacat atgatgtgaa tgcctacaaa 4560  
 gccagtgtgc ataggaacag tgggcctggg taaagagtca cattggtagg 4610

&lt;210&gt; 2

&lt;211&gt; 824

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 2

Met Ser Ala Pro Ser Glu Glu Glu Glu Tyr Ala Arg Leu Val Met Glu  
 1 5 10 15

Ala Gln Pro Glu Trp Leu Arg Ala Glu Val Lys Arg Leu Ser His Glu  
 20 25 30

Leu Ala Glu Thr Thr Arg Glu Lys Ile Gln Ala Ala Glu Tyr Gly Leu  
 35 40 45

Ala Val Leu Glu Glu Lys His Gln Leu Lys Leu Gln Phe Glu Glu Leu  
50 55 60

Glu Val Asp Tyr Glu Ala Ile Arg Ser Glu Met Glu Gln Leu Lys Glu  
65 70 75 80

Ala Phe Gly Gln Ala His Thr Asn His Lys Lys Val Ala Ala Asp Gly  
85 90 95

Glu Ser Arg Glu Glu Ser Leu Ile Gln Glu Ser Ala Ser Lys Glu Gln  
100 105 110

Tyr Tyr Val Arg Lys Val Leu Glu Leu Gln Thr Glu Leu Lys Gln Leu  
115 120 125

Arg Asn Val Leu Thr Asn Thr Gln Ser Glu Asn Glu Arg Leu Ala Ser  
130 135 140

Val Ala Gln Glu Leu Lys Glu Ile Asn Gln Asn Val Glu Ile Gln Arg  
145 150 155 160

Gly Arg Leu Arg Asp Asp Ile Lys Glu Tyr Lys Phe Arg Glu Ala Arg  
165 170 175

Leu Leu Gln Asp Tyr Ser Glu Leu Glu Glu Asn Ile Ser Leu Gln  
180 185 190

Lys Gln Val Ser Val Leu Arg Gln Asn Gln Val Glu Phe Glu Gly Leu  
195 200 205

Lys His Glu Ile Lys Arg Leu Glu Glu Glu Thr Glu Tyr Leu Asn Ser  
210 215 220

Gln Leu Glu Asp Ala Ile Arg Leu Lys Glu Ile Ser Glu Arg Gln Leu  
225 230 235 240

Glu Glu Ala Leu Glu Thr Leu Lys Thr Glu Arg Glu Gln Lys Asn Ser  
245 250 255

Leu Arg Lys Glu Leu Ser His Tyr Met Ser Ile Asn Asp Ser Phe Tyr  
260 265 270

Thr Ser His Leu His Val Ser Leu Asp Gly Leu Lys Phe Ser Asp Asp  
275 280 285

Ala Ala Glu Pro Asn Asn Asp Ala Glu Ala Leu Val Asn Gly Phe Glu  
290 295 300

His Gly Gly Leu Ala Lys Leu Pro Leu Asp Asn Lys Thr Ser Thr Pro  
305 310 315 320

Lys Lys Glu Gly Leu Ala Pro Pro Ser Pro Ser Leu Val Ser Asp Leu  
325 330 335

Leu Ser Glu Leu Asn Ile Ser Glu Ile Gln Lys Leu Lys Gln Gln Leu  
340 345 350

Met Gln Met Glu Arg Glu Lys Ala Gly Leu Leu Ala Thr Leu Gln Asp  
355 360 365

Thr Gln Lys Gln Leu Glu His Thr Arg Gly Ser Leu Ser Glu Gln Gln

370	375	380
Glu Lys Val Thr Arg Leu Thr Glu Asn Leu Ser Ala Leu Arg Arg Leu 385 390 395 400		
Gln Ala Ser Lys Glu Arg Gln Thr Ala Leu Asp Asn Glu Lys Asp Arg 405 410 415		
Asp Ser His Glu Asp Gly Asp Tyr Tyr Glu Val Asp Ile Asn Gly Pro 420 425 430		
Glu Ile Leu Ala Cys Lys Tyr His Val Ala Val Ala Glu Ala Gly Glu 435 440 445		
Leu Arg Glu Gln Leu Lys Ala Leu Arg Ser Thr His Glu Ala Arg Glu 450 455 460		
Ala Gln His Ala Glu Glu Lys Gly Arg Tyr Glu Ala Glu Gly Gln Ala 465 470 475 480		
Leu Thr Glu Lys Val Ser Leu Leu Glu Lys Ala Ser Arg Gln Asp Arg 485 490 495		
Glu Leu Leu Ala Arg Leu Glu Lys Glu Leu Lys Lys Val Ser Asp Val 500 505 510		
Ala Gly Glu Thr Gln Gly Ser Leu Ser Val Ala Gln Asp Glu Leu Val 515 520 525		
Thr Phe Ser Glu Glu Leu Ala Asn Leu Tyr His His Val Cys Met Cys 530 535 540		
Asn Asn Glu Thr Pro Asn Arg Val Met Leu Asp Tyr Tyr Arg Glu Gly 545 550 555 560		
Gln Gly Gly Ala Gly Arg Thr Ser Pro Gly Gly Arg Thr Ser Pro Glu 565 570 575		
Ala Arg Gly Arg Arg Ser Pro Ile Leu Leu Pro Lys Gly Leu Leu Ala 580 585 590		
Pro Glu Ala Gly Arg Ala Asp Gly Gly Thr Gly Asp Ser Ser Pro Ser 595 600 605		
Pro Gly Ser Ser Leu Pro Ser Pro Leu Ser Asp Pro Arg Arg Glu Pro 610 615 620		
Met Asn Ile Tyr Asn Leu Ile Ala Ile Ile Arg Asp Gln Ile Lys His 625 630 635 640		
Leu Gln Ala Ala Val Asp Arg Thr Thr Glu Leu Ser Arg Gln Arg Ile 645 650 655		
Ala Ser Gln Glu Leu Gly Pro Ala Val Asp Lys Asp Lys Glu Ala Leu 660 665 670		
Met Glu Glu Ile Leu Lys Leu Lys Ser Leu Leu Ser Thr Lys Arg Glu 675 680 685		
Gln Ile Thr Thr Leu Arg Thr Val Leu Lys Ala Asn Lys Gln Thr Ala 690 695 700		

Glu Val Ala Leu Ala Asn Leu Lys Ser Lys Tyr Glu Asn Glu Lys Ala  
705 710 715 720

Met Val Thr Glu Thr Met Met Lys Leu Arg Asn Glu Leu Lys Ala Leu  
725 730 735

Lys Glu Asp Ala Ala Thr Phe Ser Ser Leu Arg Ala Met Phe Ala Thr  
740 745 750

Arg Cys Asp Glu Tyr Ile Thr Gln Leu Asp Glu Met Gln Arg Gln Leu  
755 760 765

Ala Ala Ala Glu Asp Glu Lys Lys Thr Leu Asn Ser Leu Leu Arg Met  
770 775 780

Ala Ile Gln Gln Lys Leu Ala Leu Thr Gln Arg Leu Glu Leu Leu Glu  
785 790 795 800

Leu Asp His Glu Gln Thr Arg Arg Gly Arg Ala Lys Ala Ala Pro Lys  
805 810 815

Thr Lys Pro Ala Thr Pro Ser Leu  
820

<210> 3

<211> 2940

<212> DNA

<213> Homo sapiens

<400> 3

```

atgtcgggtgc tgggcgagta cgagcgacac tgcgattcca tcaactcgga ctttggggagc 60
gagtcggggg gttgcgggga ctcgagtcgg gggcctagcg ccagtcaggg gccgcgagcc 120
ggcggcgggcg cggcgggagca ggaggaactg cactacatcc ccatccgcgt cctggggccgc 180
ggcgcccttcg gggaagccac gctgtaccgc cgcaccgagg atgactcact ggttgtgtgtg 240
aaggaagtgcg atttgaccgc gctgtctgag aaggaacgtc gtgatgcctt gaatgagatt 300
gttattcttg cactgctgca gcatgacaac attattgcct actacaatca cttcatggac 360
aataccacgc tgctgattga gctggaatat tgtaatggag ggaacctgta tgacaaaaatc 420
cttcgtcaga aggacaagtt gtttgaggaa gagatgggtg tgtggtacct atttcagatt 480
gtttcagcag tgagctgcat ccataaagct ggaatccttc atagagatat aaagacatta 540
aatatttttc tgaccaaggc aaacctgata aaacttggag attatggcct agcaaagaaa 600
cttaattctg agtattccat ggctgagacg cttgtgggaa ccccatatta catgtctcca 660
gagctctgtc aaggagtaaa gtacaatttc aagtctgata tctgggcagt tggctgcgtc 720
atttttgaac tgcttacctt aaagaggacg tttgatgcta caaaccact taacctgtgt 780
gtgaagatcg tgcaaggaat tcgggccatg gaagttagct ctagccagta ctctttggaa 840
ttgatccaaa tggttcattc gtgccttgac caggatcctg agcagagacc tactgcagat 900
gaacttctag atcgccctct tctcaggaaa cgcaggagag agatggagga aaaagtcact 960
ctgcttaatg cacctacaaa gagaccaagg tcaagcactg tgactgaagc acccattgct 1020
gtagtaacat cacgaaccag tgaagtctat gtttgggtg gtggaaaatc cccccccag 1080
aaactggatg ttatcaagag tggctgtagt gcccggcagg tctgtgcagg gaataccac 1140
tttgctgtgg tcacagtgga gaaggaactg tacacttggg tgaacatgca aggaggcact 1200
aaactccatg gtcagctggg ccatggagac gtgtcatgtg gtgatgattt cactgtctgt 1260
gaaaagttgc aaggcaaagc tatccatcag gtgtcatgtg gtgatgattt cactgtctgt 1320
gtgactgatg agggtcagct ctatgccttc ggatcagatt attatggctg catgggggtg 1380
gacaaagttg ctggccctga agtgctagaa cccatgcagc tgaacttctt cctcagcaat 1440
ccagtggagc aggtctcctg tggagataat catgtggtgg ttctgacacg aaacaaggaa 1500
gtctattctt ggggctgtgg cgaatatgga cgaactgggt tggattcaga agaggattat 1560
tatacaccac aaaaggtgga tgttcccaag gccttgatta ttgttgcagt tcaatgtggc 1620
tgtgatggga catttctgtt gaccagtcga ggcaaagtgc tggcctgtgg actcaatgaa 1680
ttcaataagc tgggtctgaa tcagtgcatt tcgggaatta tcaaccatga agcataccat 1740

```

```

gaagttccct acacaacgtc ctttaccttg gccaaacagt tgtcctttta taagatccgt 1800
accattgccc caggcaagac tcacacagct gctattgatg agcgaggccg gctgctgacc 1860
tttggctgca acaagtgtgg gcagctgggc gttgggaact acaagaagcg tctgggaatc 1920
aacctgttgg ggggaccctt tgggtgggaag caagtgatca ggggtctcctg cggatgatgag 1980
tttaccattg ctgccactga tgataatcac atttttgcct ggggcaatgg tggtaatggc 2040
cgcttgcaa tgacccccac agagagacca catggctctg atatctgtac ctcatggcct 2100
cggcctattt ttggatctct gcatcatgtc ccggacctgt cttgccgtgg atggcatacc 2160
attctcatcg ttgagaaagt attgaattct aagaccatcc gttccaatag cagtggctta 2220
tccattggaa ctgtgtttca gagctctagc cggggaggag gcggcggggg cggcgggtgt 2280
gaagaagagg acagtcagca ggaatctgaa actcctgacc caagtggagg cttccgagga 2340
acaatggaag cagaccgagg aatggaagg ttaatcagtc ccacagaggc catggggaac 2400
agtaattggg ccagcagctc ctgtcctggc tggcttcgaa aggagctgga aaatgcagaa 2460
tttatcccca tgctgacag cccatctcct ctcatgtcag cgttttcaga atctgagaaa 2520
gataccctgc cctatgaaga gctgcaagga ctcaaagtgg cctctgaagc tcctttggaa 2580
caciaaaccac aagtagaagc ctgctcacct cggctgaatc ctgcagtaac ctgtgctggg 2640
aagggaacac cactgactcc tctgctgtgt gcgtgcagct ctctgcaggt ggaggttgag 2700
agattgcagg gtctggtgtt aaagtgtctg gctgaacaac agaagctaca gcaagaaaac 2760
ctccagattt ttacccaact gcagaagttg aacaagaaat tagaaggagg gcagcaggtg 2820
gggatgcatt ccaaaggaac tcagacagca aaggaagaga tggaaatgga tccaaagcct 2880
gacttagatt cagattcctg gtgcctcctg ggaacagact cctgtagacc cagcctctag 2940

```

<210> 4  
 <211> 979  
 <212> PRT  
 <213> Homo sapiens

```

<400> 4
Met Ser Val Leu Gly Glu Tyr Glu Arg His Cys Asp Ser Ile Asn Ser
  1             5             10             15

Asp Phe Gly Ser Glu Ser Gly Gly Cys Gly Asp Ser Ser Pro Gly Pro
      20             25             30

Ser Ala Ser Gln Gly Pro Arg Ala Gly Gly Gly Ala Ala Glu Gln Glu
      35             40             45

Glu Leu His Tyr Ile Pro Ile Arg Val Leu Gly Arg Gly Ala Phe Gly
      50             55             60

Glu Ala Thr Leu Tyr Arg Arg Thr Glu Asp Asp Ser Leu Val Val Trp
      65             70             75             80

Lys Glu Val Asp Leu Thr Arg Leu Ser Glu Lys Glu Arg Arg Asp Ala
      85             90             95

Leu Asn Glu Ile Val Ile Leu Ala Leu Leu Gln His Asp Asn Ile Ile
      100            105            110

Ala Tyr Tyr Asn His Phe Met Asp Asn Thr Thr Leu Leu Ile Glu Leu
      115            120            125

Glu Tyr Cys Asn Gly Gly Asn Leu Tyr Asp Lys Ile Leu Arg Gln Lys
      130            135            140

Asp Lys Leu Phe Glu Glu Glu Met Val Val Trp Tyr Leu Phe Gln Ile
      145            150            155            160

Val Ser Ala Val Ser Cys Ile His Lys Ala Gly Ile Leu His Arg Asp
      165            170            175

Ile Lys Thr Leu Asn Ile Phe Leu Thr Lys Ala Asn Leu Ile Lys Leu

```

180										185					190						
Gly	Asp	Tyr	Gly	Leu	Ala	Lys	Lys	Leu	Asn	Ser	Glu	Tyr	Ser	Met	Ala						
		195					200					205									
Glu	Thr	Leu	Val	Gly	Thr	Pro	Tyr	Tyr	Met	Ser	Pro	Glu	Leu	Cys	Gln						
	210					215					220										
Gly	Val	Lys	Tyr	Asn	Phe	Lys	Ser	Asp	Ile	Trp	Ala	Val	Gly	Cys	Val						
225					230					235					240						
Ile	Phe	Glu	Leu	Leu	Thr	Leu	Lys	Arg	Thr	Phe	Asp	Ala	Thr	Asn	Pro						
				245					250					255							
Leu	Asn	Leu	Cys	Val	Lys	Ile	Val	Gln	Gly	Ile	Arg	Ala	Met	Glu	Val						
			260					265					270								
Asp	Ser	Ser	Gln	Tyr	Ser	Leu	Glu	Leu	Ile	Gln	Met	Val	His	Ser	Cys						
		275					280					285									
Leu	Asp	Gln	Asp	Pro	Glu	Gln	Arg	Pro	Thr	Ala	Asp	Glu	Leu	Leu	Asp						
	290					295					300										
Arg	Pro	Leu	Leu	Arg	Lys	Arg	Arg	Arg	Glu	Met	Glu	Glu	Lys	Val	Thr						
305					310					315					320						
Leu	Leu	Asn	Ala	Pro	Thr	Lys	Arg	Pro	Arg	Ser	Ser	Thr	Val	Thr	Glu						
				325					330					335							
Ala	Pro	Ile	Ala	Val	Val	Thr	Ser	Arg	Thr	Ser	Glu	Val	Tyr	Val	Trp						
			340					345					350								
Gly	Gly	Gly	Lys	Ser	Thr	Pro	Gln	Lys	Leu	Asp	Val	Ile	Lys	Ser	Gly						
		355					360					365									
Cys	Ser	Ala	Arg	Gln	Val	Cys	Ala	Gly	Asn	Thr	His	Phe	Ala	Val	Val						
	370					375					380										
Thr	Val	Glu	Lys	Glu	Leu	Tyr	Thr	Trp	Val	Asn	Met	Gln	Gly	Gly	Thr						
385					390					395					400						
Lys	Leu	His	Gly	Gln	Leu	Gly	His	Gly	Asp	Lys	Ala	Ser	Tyr	Arg	Gln						
			405					410						415							
Pro	Lys	His	Val	Glu	Lys	Leu	Gln	Gly	Lys	Ala	Ile	His	Gln	Val	Ser						
			420					425					430								
Cys	Gly	Asp	Asp	Phe	Thr	Val	Cys	Val	Thr	Asp	Glu	Gly	Gln	Leu	Tyr						
		435					440					445									
Ala	Phe	Gly	Ser	Asp	Tyr	Tyr	Gly	Cys	Met	Gly	Val	Asp	Lys	Val	Ala						
	450					455					460										
Gly	Pro	Glu	Val	Leu	Glu	Pro	Met	Gln	Leu	Asn	Phe	Phe	Leu	Ser	Asn						
465					470					475					480						
Pro	Val	Glu	Gln	Val	Ser	Cys	Gly	Asp	Asn	His	Val	Val	Val	Leu	Thr						
				485				490						495							
Arg	Asn	Lys	Glu	Val	Tyr	Ser	Trp	Gly	Cys	Gly	Glu	Tyr	Gly	Arg	Leu						
			500					505					510								

Gly Leu Asp Ser Glu Glu Asp Tyr Tyr Thr Pro Gln Lys Val Asp Val  
515 520 525

Pro Lys Ala Leu Ile Ile Val Ala Val Gln Cys Gly Cys Asp Gly Thr  
530 535 540

Phe Leu Leu Thr Gln Ser Gly Lys Val Leu Ala Cys Gly Leu Asn Glu  
545 550 555 560

Phe Asn Lys Leu Gly Leu Asn Gln Cys Met Ser Gly Ile Ile Asn His  
565 570 575

Glu Ala Tyr His Glu Val Pro Tyr Thr Thr Ser Phe Thr Leu Ala Lys  
580 585 590

Gln Leu Ser Phe Tyr Lys Ile Arg Thr Ile Ala Pro Gly Lys Thr His  
595 600 605

Thr Ala Ala Ile Asp Glu Arg Gly Arg Leu Leu Thr Phe Gly Cys Asn  
610 615 620

Lys Cys Gly Gln Leu Gly Val Gly Asn Tyr Lys Lys Arg Leu Gly Ile  
625 630 635 640

Asn Leu Leu Gly Gly Pro Leu Gly Gly Lys Gln Val Ile Arg Val Ser  
645 650 655

Cys Gly Asp Glu Phe Thr Ile Ala Ala Thr Asp Asp Asn His Ile Phe  
660 665 670

Ala Trp Gly Asn Gly Gly Asn Gly Arg Leu Ala Met Thr Pro Thr Glu  
675 680 685

Arg Pro His Gly Ser Asp Ile Cys Thr Ser Trp Pro Arg Pro Ile Phe  
690 695 700

Gly Ser Leu His His Val Pro Asp Leu Ser Cys Arg Gly Trp His Thr  
705 710 715 720

Ile Leu Ile Val Glu Lys Val Leu Asn Ser Lys Thr Ile Arg Ser Asn  
725 730 735

Ser Ser Gly Leu Ser Ile Gly Thr Val Phe Gln Ser Ser Ser Pro Gly  
740 745 750

Gly Gly Gly Gly Gly Gly Gly Gly Glu Glu Glu Asp Ser Gln Gln Glu  
755 760 765

Ser Glu Thr Pro Asp Pro Ser Gly Gly Phe Arg Gly Thr Met Glu Ala  
770 775 780

Asp Arg Gly Met Glu Gly Leu Ile Ser Pro Thr Glu Ala Met Gly Asn  
785 790 795 800

Ser Asn Gly Ala Ser Ser Ser Cys Pro Gly Trp Leu Arg Lys Glu Leu  
805 810 815

Glu Asn Ala Glu Phe Ile Pro Met Pro Asp Ser Pro Ser Pro Leu Ser  
820 825 830



Ala Ala Phe Ser Glu Ser Glu Lys Asp Thr Leu Pro Tyr Glu Glu Leu  
835 840 845

Gln Gly Leu Lys Val Ala Ser Glu Ala Pro Leu Glu His Lys Pro Gln  
850 855 860

Val Glu Ala Ser Ser Pro Arg Leu Asn Pro Ala Val Thr Cys Ala Gly  
865 870 875 880

Lys Gly Thr Pro Leu Thr Pro Pro Ala Cys Ala Cys Ser Ser Leu Gln  
885 890 895

Val Glu Val Glu Arg Leu Gln Gly Leu Val Leu Lys Cys Leu Ala Glu  
900 905 910

Gln Gln Lys Leu Gln Gln Glu Asn Leu Gln Ile Phe Thr Gln Leu Gln  
915 920 925

Lys Leu Asn Lys Lys Leu Glu Gly Gly Gln Gln Val Gly Met His Ser  
930 935 940

Lys Gly Thr Gln Thr Ala Lys Glu Glu Met Glu Met Asp Pro Lys Pro  
945 950 955 960

Asp Leu Asp Ser Asp Ser Trp Cys Leu Leu Gly Thr Asp Ser Cys Arg  
965 970 975

Pro Ser Leu

<210> 5  
<211> 21  
<212> DNA  
<213> Mus sp.

<400> 5  
ccggtggatg tggaatgtgt g 21

<210> 6  
<211> 22  
<212> DNA  
<213> Mus sp.

<400> 6  
caaagccaag gttcattcgg tg 22

<210> 7  
<211> 22  
<212> DNA  
<213> Mus sp.

<400> 7  
gccctgaatg aactgcagga cg 22

<210> 8  
<211> 22  
<212> DNA  
<213> Mus sp.

<400> 8

cacgggtagc caacgctatg tc	22
<210> 9	
<211> 21	
<212> DNA	
<213> Mus sp.	
<400> 9	21
cttccgcttc cacgacactc g	
<210> 10	
<211> 21	
<212> DNA	
<213> Mus sp.	
<400> 10	21
ctcaatggcc tcagacgcc a g	
<210> 11	
<211> 20	
<212> DNA	
<213> Homo sapiens	
<400> 11	20
gcctttggac aagcacacac	
<210> 12	
<211> 19	
<212> DNA	
<213> Homo sapiens	
<400> 12	19
ctccttcagc tcttgggcc	
<210> 13	
<211> 30	
<212> DNA	
<213> Homo sapiens	
<400> 13	30
cgagctgctc tatagactgc tgggtagtcc	
<210> 14	
<211> 30	
<212> DNA	
<213> Homo sapiens	
<400> 14	30
taacagaggt ggcttatgag tatttcttcc	
<210> 15	
<211> 20	
<212> DNA	
<213> Homo sapiens	
<400> 15	20
aaaccacaag aaggtggctg	
<210> 16	
<211> 22	
<212> DNA	

<213> Homo sapiens

<400> 16

aggtgaagcg gctgtccac ga

22

<210> 17

<211> 22

<212> DNA

<213> Homo sapiens

<400> 17

ctccttcagc tcctgggcca ca

22

<210> 18

<211> 821

<212> PRT

<213> Homo sapiens

<400> 18

Met Ala Ala Glu Glu Val Leu Gln Thr Val Asp His Tyr Lys Thr Glu  
1 5 10 15

Ile Glu Arg Leu Thr Lys Glu Leu Thr Glu Thr Thr His Glu Lys Ile  
20 25 30

Gln Ala Ala Glu Tyr Gly Leu Val Val Leu Glu Glu Lys Leu Thr Leu  
35 40 45

Lys Gln Gln Tyr Asp Glu Leu Glu Ala Glu Tyr Asp Ser Leu Lys Gln  
50 55 60

Glu Leu Glu Gln Leu Lys Glu Ala Phe Gly Gln Ser Phe Ser Ile His  
65 70 75 80

Arg Lys Val Ala Glu Asp Gly Glu Thr Arg Glu Glu Thr Leu Leu Gln  
85 90 95

Glu Ser Ala Ser Lys Glu Ala Tyr Tyr Leu Gly Lys Ile Leu Glu Met  
100 105 110

Gln Asn Glu Leu Lys Gln Ser Arg Ala Val Val Thr Asn Val Gln Ala  
115 120 125

Glu Asn Glu Arg Leu Thr Ala Val Val Gln Asp Leu Lys Glu Asn Asn  
130 135 140

Glu Met Val Glu Leu Gln Arg Ile Arg Met Lys Asp Glu Ile Arg Glu  
145 150 155 160

Tyr Lys Phe Arg Glu Ala Arg Leu Leu Gln Asp Tyr Thr Glu Leu Glu  
165 170 175

Glu Glu Asn Ile Thr Leu Gln Lys Leu Val Ser Thr Leu Lys Gln Asn  
180 185 190

Gln Val Glu Tyr Glu Gly Leu Lys His Glu Ile Lys Arg Phe Glu Glu  
195 200 205

Glu Thr Val Leu Leu Asn Ser Gln Leu Glu Asp Ala Ile Arg Leu Lys  
210 215 220

Glu Ile Ala Glu His Gln Leu Glu Glu Ala Leu Glu Thr Leu Lys Asn  
225 230 235 240

Glu Arg Glu Gln Lys Asn Asn Leu Arg Lys Glu Leu Ser Gln Tyr Ile  
245 250 255

Ser Leu Asn Asp Asn His Ile Ser Ile Ser Val Asp Gly Leu Lys Phe  
260 265 270

Ala Glu Asp Gly Ser Glu Pro Asn Asn Asp Asp Lys Met Asn Gly His  
275 280 285

Ile His Gly Pro Leu Val Lys Leu Asn Gly Asp Tyr Arg Thr Pro Thr  
290 295 300

Leu Arg Lys Gly Glu Ser Leu Asn Pro Val Ser Asp Leu Phe Ser Glu  
305 310 315 320

Leu Asn Ile Ser Glu Ile Gln Lys Leu Lys Gln Gln Leu Met Gln Val  
325 330 335

Glu Arg Glu Lys Ala Ile Leu Leu Ala Asn Leu Gln Glu Ser Gln Thr  
340 345 350

Gln Leu Glu His Thr Lys Gly Ala Leu Thr Glu Gln His Glu Arg Val  
355 360 365

His Arg Leu Thr Glu His Val Asn Ala Met Arg Gly Leu Gln Ser Ser  
370 375 380

Lys Glu Leu Lys Ala Glu Leu Asp Gly Glu Lys Gly Arg Asp Ser Gly  
385 390 395 400

Glu Glu Ala His Asp Tyr Glu Val Asp Ile Asn Gly Leu Glu Ile Leu  
405 410 415

Glu Cys Lys Tyr Arg Val Ala Val Thr Glu Val Ile Asp Leu Lys Ala  
420 425 430

Glu Ile Lys Ala Leu Lys Glu Lys Tyr Asn Lys Ser Val Glu Asn Tyr  
435 440 445

Thr Asp Glu Lys Ala Lys Tyr Glu Ser Lys Ile Gln Met Tyr Asp Glu  
450 455 460

Gln Val Thr Ser Leu Glu Lys Thr Thr Lys Glu Ser Gly Glu Lys Met  
465 470 475 480

Ala His Met Glu Lys Glu Leu Gln Lys Met Thr Ser Ile Ala Asn Glu  
485 490 495

Asn His Ser Thr Leu Asn Thr Ala Gln Asp Glu Leu Val Thr Phe Ser  
500 505 510

Glu Glu Leu Ala Gln Leu Tyr His His Val Cys Leu Cys Asn Asn Glu  
515 520 525

Thr Pro Asn Arg Val Met Leu Asp Tyr Tyr Arg Gln Ser Arg Val Thr  
530 535 540

Arg Ser Gly Ser Leu Lys Gly Pro Asp Asp Pro Arg Gly Leu Leu Ser

```
<210> 19
<211> 868
<212> PRT
<213> Homo sapiens
```

13

14

Glu Ser Ser Ser Leu Leu Gln Asp Lys Met Asp Leu Gln Lys Gln Val  
 340 345 350  
 Glu Asp Leu Lys Ser Gln Leu Val Ala Gln Asp Asp Ser Gln Arg Leu  
 355 360 365  
 Val Glu Gln Glu Val Gln Glu Lys Leu Arg Glu Thr Gln Glu Tyr Asn  
 370 375 380  
 Arg Ile Gln Lys Glu Leu Glu Arg Glu Lys Ala Ser Leu Thr Leu Ser  
 385 390 395 400  
 Leu Met Glu Lys Glu Gln Arg Leu Leu Val Leu Gln Glu Ala Asp Ser  
 405 410 415  
 Ile Arg Gln Gln Glu Leu Ser Ala Leu Arg Gln Asp Met Gln Glu Ala  
 420 425 430  
 Gln Gly Glu Gln Lys Glu Leu Ser Ala Gln Met Glu Leu Leu Arg Gln  
 435 440 445  
 Glu Val Lys Glu Lys Glu Ala Asp Phe Leu Ala Gln Glu Ala Gln Leu  
 450 455 460  
 Leu Glu Glu Leu Glu Ala Ser His Ile Thr Glu Gln Gln Leu Arg Ala  
 465 470 475 480  
 Ser Leu Trp Ala Gln Glu Ala Lys Ala Ala Gln Leu Gln Leu Arg Leu  
 485 490 495  
 Arg Ser Thr Glu Ser Gln Leu Glu Ala Leu Ala Ala Glu Gln Gln Pro  
 500 505 510  
 Gly Asn Gln Ala Gln Ala Gln Ala Gln Leu Ala Ser Leu Tyr Ser Ala  
 515 520 525  
 Leu Gln Gln Ala Leu Gly Ser Val Cys Glu Ser Arg Pro Glu Leu Ser  
 530 535 540  
 Gly Gly Gly Asp Ser Ala Pro Ser Val Trp Gly Leu Glu Pro Asp Gln  
 545 550 555 560  
 Asn Gly Ala Arg Ser Leu Phe Lys Arg Gly Pro Leu Leu Thr Ala Leu  
 565 570 575  
 Ser Ala Glu Ala Val Ala Ser Ala Leu His Lys Leu His Gln Asp Leu  
 580 585 590  
 Trp Lys Thr Gln Gln Thr Arg Asp Val Leu Arg Asp Gln Val Gln Lys  
 595 600 605  
 Leu Glu Glu Arg Leu Thr Asp Thr Glu Ala Glu Lys Ser Gln Val His  
 610 615 620  
 Thr Glu Leu Gln Asp Leu Gln Arg Gln Leu Ser Gln Asn Gln Glu Glu  
 625 630 635 640  
 Lys Ser Lys Trp Glu Gly Lys Gln Asn Ser Leu Glu Ser Glu Leu Met  
 645 650 655

Glu Leu His Glu Thr Met Ala Ser Leu Gln Ser Arg Leu Arg Arg Ala  
660 665 670

Glu Leu Gln Arg Met Glu Ala Gln Gly Glu Arg Glu Leu Leu Gln Ala  
675 680 685

Ala Lys Glu Asn Leu Thr Ala Gln Val Glu His Leu Gln Ala Ala Val  
690 695 700

Val Glu Ala Arg Ala Gln Ala Ser Ala Ala Gly Ile Leu Glu Glu Asp  
705 710 715 720

Leu Arg Thr Ala Arg Ser Ala Leu Lys Leu Lys Asn Glu Glu Val Glu  
725 730 735

Ser Glu Arg Glu Arg Ala Gln Ala Leu Gln Glu Gln Gly Glu Leu Lys  
740 745 750

Val Ala Gln Gly Lys Ala Leu Gln Glu Asn Leu Ala Leu Leu Thr Gln  
755 760 765

Thr Leu Ala Glu Arg Glu Glu Glu Val Glu Thr Leu Arg Gly Gln Ile  
770 775 780

Gln Glu Leu Glu Lys Gln Arg Glu Met Gln Lys Ala Ala Leu Glu Leu  
785 790 795 800

Leu Ser Leu Asp Leu Lys Lys Arg Asn Gln Glu Val Asp Leu Gln Gln  
805 810 815

Glu Gln Ile Gln Glu Leu Glu Lys Cys Arg Ser Val Leu Glu His Leu  
820 825 830

Pro Met Ala Val Gln Glu Arg Glu Gln Lys Leu Thr Val Gln Arg Glu  
835 840 845

Gln Ile Arg Glu Leu Glu Lys Asp Arg Glu Thr Gln Arg Asn Val Leu  
850 855 860

Glu His Gln Leu  
865